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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/005,244 | 12/03/2001 | Dieter Klaus Weller | 010949 | 7904 |

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BUCHANAN INGERSOLL, P.C.
ONE OXFORD CENTRE, 301 GRANT STREET
20TH FLOOR
PITTSBURGH, PA 15219

EXAMINER

BERNATZ, KEVIN M

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
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1773

DATE MAILED: 04/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/005,244

Applicant(s)

WELLER ET AL.

Examiner

Kevin M Bernatz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 1-12 and 20-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 13-17, 19 and 27-31 is/are rejected.
- 7) ☒ Claim(s) 18 and 32 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Response to Amendment

1. Amendments to claims 13 and 27, filed on February 2, 2005, have been entered in the above-identified application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Examiner's Comments

3. The Examiner notes that at primary issue in the present application is the scope afforded the language "particle" and/or "nanoparticle" (hereafter referred to in total as "particles") versus structures recited as "films". While the Examiner acknowledges that generally particles are formed via an external process and then coated or added to a binder, or ordered on substrate surface, the structure of a particle is essentially either a single crystal grain or a plurality of grains. The dimensions of the particles are generally small and for the claimed "nanoparticles" must necessarily be in the range of 1000 nm or less, which is the broadest reasonable definition afforded the term "nanoscale" or "nanosize", and hence also "nanoparticles".

Conversely, "films" are generally recognized as fully functional layers deposited *in-situ* and can also possess a structure comprising single crystal grains or a plurality of grains. While particles are generally spherical, ellipsoidal, acicular or tabular in shape, films are recognized as generally possessing a defined rectangular/square orientation.

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However, the length scale of these films can also fall in the “nanoscale” or “nanosize” range, leading to rectangular-shaped structures possessing length scales on the order of 10’s or 100’s or nanometers.

It is this similarity which leads to the pending issue in the present application. At what point does a rectangular-shaped film possessing nanosize length scales cease to be equivalent to a nanosize “particle” when the only perceivable difference between the two structures is the degree of definition afforded to the “sides” of the particles/film. Since the Examiner deems that, by itself, the term “particle” does not preclude structures possessing rectangular well-defined structure, thin-films of the nanometer length scale are deemed to read on the language “nanoparticles” provided they fall within a length scale of 1000 nm or less.

Request for Continued Examination

4. The Request for Continued Examination (RCE) under 37 CFR 1.53 (d) filed on February 2, 2005 is acceptable and a RCE has been established. An action on the RCE follows.

Claim Objections

5. Claims 18 and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 102

6. Claims 13 – 17, 19 and 27 – 31 are rejected under 35 U.S.C. 102(e) as being anticipated by Saito (U.S. Patent App. No. 2001/0006744 A1).

Regarding claims 13 and 27, Saito discloses a magnetic recording disk (*Paragraph 0002*) for magnetic recording comprising a disc substrate having a locking pattern formed therein (*Figures 2 and 4, elements 2 and 3*), the locking pattern comprising a plurality of pits formed in the disc substrate (*ibid*), and a plurality of nanoparticles (*elements 7 and 8 and Paragraph 0058*) completely filling the plurality of pits (*Figures 2 and 4, element 5*) and exhibiting short-range order characteristics (*ibid*), wherein each individual pit includes a plurality (i.e. “2+”) of nanoparticles therein (*elements 7 and 8 within region 5*).

Regarding claims 14, 15, 28 and 29, Saito discloses nanoparticles meeting applicants’ claimed limitations (*Paragraphs 0013, 0045, 0058, 0059 and examples*).

Regarding claims 16, 17, 19, 30 and 31 Saito discloses substrates, pit depths and protective layers meeting applicants’ claimed limitations (*Paragraphs 0042, 0050 and 0057*).

Response to Arguments

7. The rejection of claims 13 – 19 and 27 - 32 under 35 U.S.C § 102(a) and/or (e) – Kikitsu et al.

Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

The above noted rejection has been withdrawn because applicant(s) amendment(s) have set forth new limitations (e.g. "wherein each individual pit includes a plurality of nanoparticles therein") no longer anticipated, nor rendered obvious, by the above noted rejection.

8. The rejection of claims 13 – 19 and 27 - 32 under 35 U.S.C § 102(e) – Asakawa et al.

Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

The above noted rejection has been withdrawn because applicant(s) amendment(s) have set forth new limitations (e.g. "wherein each individual pit includes a plurality of nanoparticles therein") no longer anticipated, nor rendered obvious, by the above noted rejection.

Allowable Subject Matter

9. The following is a statement of reasons for the indication of allowable subject matter: claims 18 and 32 recite a "self-assembly-coherence length scale of 100 – 1000 nm", which is not taught nor rendered obvious by the prior art of record.

While the prior art of record teach an "ordered" structure in that the 2 or more thin-films are deposited in a uniform order within the pits, the thin films do not exhibit self-assembly characteristics, nor do they exhibit an ordered length scale of 100 – 1000

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nm (see *Paragraph 4 of the Office Action mailed May 6, 2004 for the scope afforded the term "self-assembly-coherence length scale"*).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Murray et al. (U.S. Patent No. 6,262,129 B1) teach forming nanoparticles on substrates, but teach away from grouping the nanoparticles together (*col. 11*) and fails to teach or render obvious the use of a substrate comprising pits containing a plurality of nanoparticles therein. Momose et al. (U.S. Patent App. No. 2004/0229006 A1) teach a substrate comprising pits and a plurality of nanoparticles therein, though the nanoparticles are deposited in a perpendicular manner relative to the bottom of the pit versus applicants' deposition in an "in-plane" manner (*Figures*). The Examiner notes that Momose et al. does not qualify as prior art under 35 U.S.C. 102 and/or 103 since the effective filing date of Momose et al. post dates applicants' effective filing date.

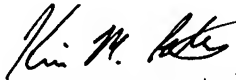
11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M Bernatz whose telephone number is (571) 272-1505. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KMB
April 14, 2005


Kevin M. Bernatz, PhD
Primary Examiner